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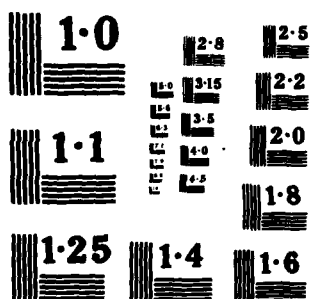
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DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION

AERONAUTICAL RESEARCH LABORATORIES

MELBOURNE, VICTORIA

AD-A160 807

Aero Propulsion Technical Memorandum 429

REPORT ON INTEREST EXPRESSED IN SOME AUSTRALIAN  
DEFENCE ESTABLISHMENT PRODUCTS DISPLAYED AT THE 1985  
PARIS AIR SHOW

U.R. Krieser

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DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION  
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REPORT ON INTEREST EXPRESSED IN SOME AUSTRALIAN DEFENCE  
ESTABLISHMENT PRODUCTS DISPLAYED AT THE 1985 PARIS AIR SHOW

by  
U.R. Krieser

SUMMARY

During June 1985 a number of aerospace products developed in Australia were displayed at the Paris Air Show. The Department of Defence was one of 16 exhibitors, and presented 14 products which it considered to have commercial potential on the world market.

As co-inventor of the Transmission Fatigue Life Usage Indicator (FLUI), which was one of the Department of Defence products exhibited, the author was seconded, as a technical representative to the official Defence product promotions team at the Air Show. Considerable interest was shown in the Department of Defence products presented in Paris, and subsequent visits to aerospace companies in Israel, further demonstrated strong overseas interest in both manufacture and purchase of these products.



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POSTAL ADDRESS: Director, Aeronautical Research Laboratories,  
P.O. Box 4331, Melbourne, Victoria, 3001, Australia.

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## CONTENTS

	<u>Page No.</u>
1. INTRODUCTION	1
2. JUNE 1985 PARIS AIR SHOW OVERVIEW	2
3. AUSTRALIAN PRODUCTS DISPLAYED	3
3.1 Pilots Force Measurement Glove	4
3.2 Doppler Navigation Trainer	4
3.3 Lifesaving Parachute	4
3.4 Neo-natal Retrieval Unit (AEROMED)	4
3.5 Winnin Rapid Launch All Weather Offboard Decoy	4
3.6 Transmission Fatigue Life Usage Indicator (FLUI)	4
3.7 Remote Control Parachute System	5
3.8 Box-Launched Ikara	5
3.9 Barra Sonobuoy	5
4. EXPRESSIONS OF INTEREST IN FLUI	6
5. EXPRESSIONS OF INTEREST IN OTHER AUSTRALIAN PRODUCTS	6
6. INTEREST EXPRESSED BY ISRAELI COMPANIES IN AUSTRALIAN PRODUCTS DISPLAYED AT THE PARIS AIR SHOW	8
6.1 Discussions with Mata Helicopter Jerusalem - a Subsidiary of Israel Aircraft Industries (IAI)	8
6.2 Discussions with Elta Electronics Industries Ltd.	10
6.3 Discussions with Mistral Technology Co.	11
7. CONCLUDING REMARKS	12
ACKNOWLEDGEMENTS	14
REFERENCE	15
APPENDIX A: POSTAL ADDRESS OF ISRAELI AEROSPACE COMPANIES VISITED BY AUTHOR	16
FIGURES	17
DISTRIBUTION	
DOCUMENT CONTROL DATA	

## 1. INTRODUCTION

The scale of Australia's participation at the 1985 Paris Air Show far exceeded that of previous years. The Department of Defence and 14 companies which were members of the Association of Australian Aerospace Industries (AAAI) were the main exhibitors. The preparation for this Air Show was the responsibility of the Department of Trade. The Australian stand and displays were designed to highlight each exhibit in an attractive visual presentation, with written handouts, video and audio backup.

The construction of the display stand, including video display booth and a customer discussion area, was organized by officers of the Department of Trade. The presentation of Defence Department exhibits was organized by the Office of Defence Production of the Department of Defence.

Details in relation to the Defence representatives for the Air Show are given in the following table:

NAME	DEPARTMENT	POSITION HELD	DUTIES AT THE SHOW
Mr K. Keeling	Defence/ Office of Defence Production	Director Marketing Operations	Team co-ordinator
Dr R. Creaser	Defence/ DSTO-Major Project Branch	Consultant	Scientific adviser for Winnin
Mr C. Blair	Defence/ Office of Defence	Public Relations Officer	Officer responsible for maintaining liaison with the aviation press
Mr R. Krieser	Defence/ DSTO - Aeronautical Research Laboratories (ARL)	Experimental Officer	Technical adviser and display demonstrator

The author's secondment to the Defence promotions team for the Paris Air Show was largely a consequence of his involvement as co-inventor of FLUI with Mr K. F. Fraser of the Aeronautical Research Laboratories. His general technical expertise together with his familiarity with some of the other products being displayed by the Department of Defence, also contributed to the selection of the author for official representation at the show.

Active hardware displays at the Defence Department stand consisted of operational equipment such as the Transmission Fatigue Life Usage Indicator (FLUI), the Doppler Trainer and the Instrumented Glove, while static hardware displays consisted of the Life Saving Parachute, Neo-natal Retrieval Unit, Box-launched Ikara and Barra Sonobuoy. It was the responsibility of the Defence personnel present to supervise the stand whenever possible, and to refer more detailed enquiries to appropriate experts in the relevant field so that a rapid response to these enquiries could be achieved. Video film for each product was prepared for individual viewing at the Air Show.

Following his technical representation on the Australian Defence stand at the Paris Air Show, the author proceeded on a privately funded visit to Israel. While in Israel, he contacted the Australian Trade Commissioner and briefed him on interest expressed by some Israeli companies in Australian Defence products displayed in Paris. As a result of the briefing, the Trade Commissioner initiated meetings between the author and relevant company representatives at the Australian Embassy. Subsequent visits were made by the author to company premises at the invitation of the companies.

This report briefly describes the products displayed by the Australian Department of Defence at the Paris Air Show, reviews interest expressed in Paris and later in Israel for these products, and provides a personal impression of some of the shortcomings of the Australian Department of Defence promotional arrangements.

## 2. JUNE 1985 PARIS AIR SHOW OVERVIEW

The first impression of Le Bourget Airport, ringed by some two thousand policemen with heavy side-arms and Doberman guard dogs, did not exactly match the author's expectations for such an auspicious gathering. However, due to external threats to disrupt the air show, security was a primary consideration.

There were 1160 exhibitors from 34 nations with Chile, China, Denmark and India being "first timers" at this 36th International Air and Space Show. Details of the Australian pavillion location and the Australian chalet, are given in Figure 1. Overall views of Le Bourget 36th Air Show are given in Figures 2 and 3. A listing of participating countries is given in Figure 4. On display at the static viewing area were some 260 aircraft, of which flight demonstrations were given of 85 of these throughout the 10 days of the show. Likewise, at the static display area were some experimental flying machines making their debut, attended by their designers, hopeful of selling their ideas to a manufacturer showing interest in marketing their products.

The sight of dozens of ultra-light aircraft standing metres away from the Russian Giant, the Condor AN124, with a maximum weight of 400 tonnes, made an interesting comparison of an aeronautical version of "David and Goliath". The sight of such extremes in flying machines was a wonderful spectacle spread over 15.7 hectares

of open display area with another 6.6 hectares of roofed-in area for under-cover displays. The visitors who attended the show (some 306,218 in total, including 109,991 professionals) from 140 countries, filled every hotel in Paris. To accommodate the daily influx of visitors, 25 hectares of car-park space were made available for those brave enough to tackle the French traffic. Many more visitors used the remarkably efficient French RER-Metro train system. This was by far the best way of commuting between Paris and Le Bourget Airport.

The Paris Air Show really started with a frantic amount of activity with urgent demands to add the "finishing touches" to the displays. Despite the late arrival of the hired audio-video player, all display personnel were eager to make a real success of the Australian participation at such a prestigious event. It was regarded as an important launching arena for Australia to enter the "hi-tech" area of the very competitive aeronautical hardware marketplace.

The show started at a mild tempo with professional enquirers being outnumbered by the many visitors eager to obtain the ever popular Australian souvenir - the Kangaroo pin. In order to promote the products on display many folders were prepared with product data, and the information was distributed to prospective customers who were also exhibitors at the air show. Each was told of the benefit that the Australian products on display could have for his business. The author approached various helicopter manufacturing companies such as Agusta, Westland, Bell-Textron, MBB and Aerospatiale, and distributed data on FLUI and its potential applications. The approach of going to prospective customers and advertising the Australian products triggered considerable interest in them.

Within two days company representatives were flocking to the Australian Defence stand at an ever-increasing rate, and at a management level, involving requests for details on the business aspects of licensing. Details of the level of interest shown by various companies are given in section 4 and 5.

At the Australian chalet the exhibitors and their guests could relax and discuss business ventures. The bar and luncheon facilities were a credit to the Australian Trade Commission. Australian wines were predominant in variety and were much sought-after. The excellent French food, complemented the enthusiasm and the pleasant atmosphere within the chalet.

### 3. AUSTRALIAN PRODUCTS DISPLAYED

The author was involved in the promotion of nine of the fourteen Department of Defence products displayed at the Paris Air Show. Brief descriptions of these items are given in the following sub-sections. More detailed descriptions of these items were made available at the Air Show.



### 3.1 Pilots Force Measurement Glove

The glove enables test pilots to gain a quantitative measurement, rather than a subjective estimate, of "control-stick" forces. These forces, when taken with the known load factor and variation in airspeed, allow calculation of critical parameters such as "stick force per g" and "stick force gradient" in non-maneuvring flight. The device is independent of aircraft flight instrumentation and can thus be used in any aircraft.

### 3.2 Doppler Navigation Trainer.

The unit allows helicopter aircrews to acquire and maintain competence in the use of the Light-weight Doppler Navigation System (LDNS), without costly in-flight training. The trainer can be used in the classroom or in a crew-members quarters. The equipment provides the most cost-effective solution to the problem of training and maintaining crew competence in the use of the LDNS.

### 3.3 Lifesaving Parachute

This parachute was designed to be used as an emergency means of air-dropping water, food and medical stores to military personnel or stranded persons in inaccessible areas, with complete confidence of landing the container without damage. The parachute offers a practical, effective and low-cost solution to the problem of dropping such stores from the air.

### 3.4 Neo-natal Retrieval Unit (AEROMED)

This high-strength, low-weight humidicrib, with associated life support and monitoring systems, ensures the safe delivery of new-born babies from remote country areas to major metropolitan hospitals for treatment. AEROMED, with its patient monitoring air and oxygen supply, self contained power source, and the facility to be powered by vehicle or aircraft supplies, is the most versatile and portable humidicrib ever produced.

### 3.5 Winnin Rapid Launch All Weather Offboard Decoy

Winnin, with its hovering rocket vehicle, forms the basis of a new generic electronic warfare system for anti-ship missile defence. This expendable decoy consists of a "rapid launch" hovering rocket which can maintain both speed and position consistent with the ship which launched it. Computer predictions have indicated the Winnin decoy system to be an effective means of protection against modern anti-ship missiles in use today.

### 3.6 Transmission Fatigue Life Usage Indicator (FLUI)

FLUI monitors the torque developed by each engine in a helicopter, stores details of the load history, and estimates the fatigue life expended for critical gears during flight. In the prototype system installed in the Royal Australian Navy (RAN) Sea King Fleet at Nowra, two copies of the basic transmission torque load data together with the estimated proportion of life expended

for the current flight are printed after each flight. These data are used by the RAN for service information, and a second copy is sent to ARL for analysis including the estimation of the safe lives of critical gears in the Sea King main rotor gearbox for RAN operating conditions.

### 3.7 Remote Control Parachute System

This novel package consists of two separate components.

- (a) A remote control unit which is used during a parachutist's descent to deliver stores via a slave parachute controlled by a transmitter and two hand-controls stored in the sleeves of the parachutist's flying suit.
- (b) A receiver which can activate parachute control winches housed within a remotely controlled unit strapped to the load which is dropped from an aircraft using a slave parachute, just before the parachutist jumps.

The winches activate the slave parachute control lines during its descent. The load with its automatic opening parachute can also be guided down using a ground-sourced transmitter control unit. Loads up to 150 kg can be dropped using the standard parachutes presently used. A drogue parachute stabilises the load during the free-fall phase. The total system has application in the military, search-and-rescue, medical and natural disaster areas. Trials with various loads, for alternative control schemes for operation from the air and the ground respectively, have been completed to the satisfaction of the Australian Army trials team.

### 3.8 Box-Launched Ikara

Ikara is a ship-launched guided torpedo carrier which delivers a homing torpedo close to the target submarine. At the optimum drop-point the payload is released and with the aid of a parachute floats down to the sea, where it begins to seek and home in on the enemy submarine below. The ship from which the carrier and torpedo are launched carries a tracking and guidance system, and derives shipborne target predictor and fire control system information from either shipboard or external sources to compute the information necessary to guide the missile to the target. The new developmental version of the Ikara has been modified for easier handling, storage and launch. This has been achieved by "folding the wings" of the missile while it is stored in the carrier.

### 3.9 Barra Sonobuoy

The Barra system used for submarine detection consists of a buoy which is launched from an aircraft or helicopter. Having been launched in the sea, an on-board electronics package transmits using a pre-selected radio frequency, information on the submarine location to a receiving aircraft until the transmitter eventually stops at the end of its working life. Signal processors which interrogate the digital data from the Barra Sonobuoy are presently

fitted into Australian P3C Orion aircraft. The total system, including the ground support, provides for rapid and convenient reconfiguration between compilation, mission support, integration and training modes under computer control. The system is presently in service with the Royal Australian Air Force (RAAF) and provides a fast and accurate means of giving target-fix information.

#### 4. EXPRESSIONS OF INTEREST IN FLUI

The interest shown in FLUI was very significant. After the initial promotion, 12 companies expressed interest to varying degrees. Excluding Winnin, which was handled in the main by a team of specialists, the number of companies expressing interest in FLUI exceeded the number which applied to any of the other products which the author was involved in promoting. The names of the companies together with their expressed areas of interest are tabulated in Figure 5.

Enquiries from company representatives showing an initial interest were often followed by second, third and even fourth visits. In the case of Plessey, Negretti, Elta, and Dowty, initial enquiries regarding various aspects of FLUI, were followed by visits from the chief engineer and then by the general manager of the respective companies. In some cases company executives flew to Paris especially to see FLUI in operation and discuss, in association with their technical experts, modification to their existing hardware, and other matters related to manufacturing. All licensing enquiries were passed to the Department of Defence via the Director of Marketing Operations (Mr. K. Keeling).

A representative from Westland Helicopter Ltd requested the author to take FLUI to the UK for further assessment and discussions. However this was not readily achievable as prior approval had not been sought from the Department of Defence. Furthermore, due to the conditions of entry to France of the Australian Defence exhibits, all items had to leave the country together, hence presenting another major obstacle to the meeting of this late request from Westland. The Westland representative was advised that it was not possible to demonstrate FLUI at the company premises in the UK at the time of the conclusion of the 1985 Paris Air Show.

#### 5. EXPRESSIONS OF INTEREST IN OTHER AUSTRALIAN PRODUCTS

A considerable amount of interest was shown in the other eight Australian Department of Defence products which the author was involved in promoting at the Air Show.

The Winnin team had the difficult task of handling enquiries from many countries, and providing appropriate technical information, while ensuring that Australian interests remain protected. Some enquiries seemed to have been made specifically to gather technical information which might allow competing companies to manufacture a product similar to Winnin without infringing patent rights on the Australian product.

It was unfortunate that the Department of Defence was unable to meet the demand for the Instrumented Glove from supplies of this product in Paris, or be in the position to quote a price and delivery date for the item. Six customers from five countries were interested in obtaining the agency for distribution, joint venture arrangement, or straight-out purchase of the glove. The market is limited for this product, yet the estimated yearly demand would be between 150 to 250 gloves.

The demand for the Life Saving Parachute was very promising. Interest was shown by six companies. One company was ready to place an immediate order for 100,000, with a similar number to be purchased on a yearly basis, if the parachute could be shown to be suitable for test missile recovery. This request indicated very clearly that the Australian products are competitively priced, and provided reliability in supply can be demonstrated, Australian industry could gain substantially from the sale of such products as this on the overseas market.

Six companies were interested in obtaining details of the conditions regarding licensing agreement, pricing etc. for the Remote Control Parachute System. The importance of advertising was confirmed by one company which became interested in this product after reading about it in the June 1983 edition of Janes Defence Weekly. Many of the companies are manufacturers of parachutes and wish to complement their product range. Presently there are two known alternative systems available overseas. However from discussions to date, the Australian system is favoured due to its unique design which provides a product which is simple to operate, easy to manufacture and controllable from another parachute or airborne station.

The special application of the AEROMED system for transporting infants to distant centres for treatment, was clearly highlighted in the video film showing the system in use. Two American companies, one a wholesaler, and the other a manufacturer of a similar adult transportation system, were very keen to obtain the rights to sell the product on the American market. The market for this product is sufficient for any appropriate Australian manufacturer to take advantage of the excellent development work done by Defence Research Centre Salisbury (DRCS) in respect of this product.

The Doppler Trainer has a limited market since the Doppler system is no longer used widely by the commercial aviation industry. However for a manufacturer of the Doppler system. Two Doppler system users, Mata Helicopter Company of Israel, and a member of Warsaw Technical University, indicated interest in the Trainer. Mata in particular was interested in finding out more about the system with the view of incorporating the Trainer as another accessory for use with the Mata Helicopter Doppler Navigation System.

Enquiries in relation to the Barra Sonobuoy and Ikara were received from companies involved in this very specialized area. Due to the significant defence potential of these items, it is Government policy to investigate the advisability of allowing their sale to particular countries. Potential sales amounting to several million dollars could not be pursued for this reason.

## 6. INTEREST EXPRESSED BY ISRAELI COMPANIES IN AUSTRALIAN

### PRODUCTS DISPLAYED AT THE PARIS AIR SHOW

While on a private visit to Israel after the Paris Air Show, the author contacted the Australian Trade Commissioner in Tel Aviv, to brief him on interest shown by Israeli companies in Australian Department of Defence products displayed in Paris. Due to many enquiries to the embassy, regarding possible marketing of hi-tech items which included FLUI, Barra, Ikara and Winnin, the author was asked by the Australian Trade Commissioner to assist him during discussions on technical aspects of these products. Highlights of discussions the author had with representatives of three Israeli companies are summarized in the following sub-sections together with impressions gained when the author accepted invitations to visit company premises. Postal addresses of the three companies are given in Appendix A.

#### 6.1 Discussions with MATA Helicopter Jerusalem- a Subsidiary of Israel Aircraft Industries (IAI)

After literature was distributed to IAI representatives at the Paris Air Show, two members from the Mata Helicopter company approached the Australian Embassy in Tel Aviv and indicated a desire to discuss a number of Australian Department of Defence products with the view to arranging for outright purchase or of examining the possibility of a joint venture manufacturing agreement.

On Sunday 30th June 1985, the author visited the Mata Helicopter factory in Jerusalem and had discussions with Mata representatives, Design Engineer Mr M. Schneider, Manager of Quality Control Mr R. Avital, and General Manager Mr M. Zahavi.

The discussions were based on the Paris Air Show Handouts' Nos.1, 2, 6 and 7. Mata expressed an interest in becoming involved in the development of some Australian products displayed in Paris and the following points summarize the MATA position.

1. MATA showed a strong interest in undertaking a joint venture operation with any Australian company in the manufacture and updating of the ARL developed Transmission Fatigue Life Usage Indicator (FLUI).
2. MATA expressed an interest in cooperating with an Australian company or ARL, in the development of an updated version of FLUI.
3. MATA would like to investigate whether one of its own products, called an Automatic Rate Descent Alarm System (ARDAS) could be incorporated as an extra feature in FLUI utilizing the same housing for both systems.
4. MATA has the capability to construct, overhaul and test all types of helicopter blades, gearboxes, and engines as well as treat blades against environmental erosion.

5. MATA is interested in offering its facilities to the Australian Services for both aircraft and blade overhaul. Presently helicopters attached to the RAAF Middle East Peace-Keeping Force are serviced by MATA. RAAF personnel indicated satisfaction with the service offered.
6. MATA has a sales organization promoting its products throughout the Western Hemisphere. It is in the unique position of belonging to the EEC market, hence it has free entry to member countries for all products. Secondly, Israel has free entry to the American market which allows it to compete on an equal basis with US companies and hence on a more favourable basis than most other companies outside the USA. Thus any product emanating from MATA would come under the above sales umbrella. Should an agreement be negotiated, MATA would like to be the sales outlet.
7. To complement its accessories, MATA is interested in evaluating the Air-to-Air Parachute System and the Doppler Navigation Trainer. MATA wishes to receive a video cassette (in VHS) which demonstrates the above products. Such a cassette was used by the Department of Defence promotions team at the Air Show and is thus available.

Details of some MATA facilities and products are given below.

[A] Ground approach monitoring for low level flying and descent of helicopters.

The ARDAS system mentioned above is specially suited to this application. It derives inputs from:

1. Rate of descent transducer (accelerometer).
2. Height-above-ground indicator (Doppler navigation system).
3. All-up weight indicator (load cell).
4. Rudder, pitch, and gyro angle sensors.
5. Ground speed indicator.

The system which the author inspected while visiting MATA has been tested in the Bell 212 Helicopter. The test program included variation in loads and flying conditions as experienced in both normal flying operation and in emergency conditions. The system gave reliable results. It is now scheduled as a standard product for helicopter fitment. This hardware is of particular importance in night flying, low level pickups, and heavy load work in windy conditions or when operating over difficult terrains.

[B] The Fitment of Gaseous Tritium Light Sources (GTLS)  
in Helicopter Rotor Night Display.

The system which comes in a "kit" form, can be fitted to any helicopter and is highly advantageous for night flying of helicopters in close formation. The light pattern produced by the rotating light sources of other helicopters and observed from the cockpit, enables pilots to immediately note any change in rotor light "disc" attitude of the other helicopters and to evaluate relative position, thus considerably reducing pilot stress and increasing aircraft safety for formation flying. It enables helicopters to be flown at distances of approximately one to three rotor diameters between blade tips.

The rotor illumination system consists of four light assemblies installed on the main rotor blade tips and blade mounting points. The assemblies are constructed of an aluminium housing, with a transparent window through which the GTLS source is visible.

[C] Test and Overhaul Facility.

The Test and Overhaul Division is capable of accepting the Bell, Sikorsky, and Westland helicopters, to name just a few helicopter companies catered for. The capability to test helicopter transmission systems up to a power level of 2500 HP is provided. Composite blades as well as metal blades are repaired with full X-Ray and ultrasonic inspection reports being issued for each blade. Metal blade edge replacement and special anti-erosion coating are available for blades. The coating protects the blade for the duration of its operational life. Dynamic and static blade balancing capabilities are available for any size of blade made to date.

Presently the company is providing all services outlined above to customers in American, South-American, African, European and Asian countries.

Mr. M. Zahavi was very keen to start negotiations with Australian representatives. The author informed him that he would be contacted by Australian representatives in due course.

6.2 Discussions with ELTA Electronics Industries Ltd.

After discussions at the Paris Air Show with the Managing Director of Elta, Dr. N. Levy, arrangements were made for the author to hold more detailed discussions with the International Marketing Manager of Elta Electronics Industries Ltd, Mr M. Manor, in Israel. The author visited the ELTA company premises on Monday 1st July 1985.

Elta Electronics is a subsidiary of Israel Aircraft Industries (IAI) Ltd, with a staff of 1800, of which over 1000 are scientists, engineers, programmers and high-level technicians.

Its annual turnover is about US \$85M and is growing annually. Its two main customers are the Israeli and the United States defence forces.

Elta manufactures radars, electronic warfare equipment, SIGINT (SIGnal and communication INTelligence) systems for shipborne and airborne use, and many more products which find application in modern defence systems.

Internationally Elta is most competitive in the range of sophisticated defence-related hardware it produces. Films and other information which were shown to the author, indicated that Elta products compare favourably with competing hardware and incorporate extra features at lower overall cost than some American counterparts.

Elta is aware that three products it wishes to purchase from Australia are in the politically sensitive area. It wishes to discuss these products further in a confidential manner with appropriate Australian representatives.

The items of interest are:

1. New folded-wings version of Ikara.
2. Barra sonobuoy (this item is of particular interest).
3. Winnin.

The company expressed an interest in pursuing a joint venture agreement to manufacture, sell and further develop, if required, some of the above three Australian products. Either complete items or sub-assemblies would be considered of interest to Elta for such company involvement. However even if no such involvement could be agreed to, Elta would still be interested in acquiring these items by direct purchase.

Should its proposal be acceptable, Elta is willing to initially forward film describing its products, and is prepared to visit Australia to discuss all relevant matters.

Knowing the sensitivity of the items in question, the author indicated that Elta would be advised regarding Australia's policy on these items.

### 6.3 Discussions with Mistral Technology Co.

On the 19th of June, the author was asked to attend the Australian Embassy in Tel Aviv to meet Mistral Technology representatives, Technical Director Mr S. Jacobs and Sales Director Aircraft Division Mr R. Shraga, who expressed interest in representing Australian aerospace companies. The author found the discussions with the directors of the company to be most informative, and consider that this company has potential to market Australian aerospace industry products.



Mistral is a company which is interested in selling and promoting Australian products in Israel, Europe and the USA. The company staff, from the management personnel down, have the expertise to fully comprehend the technical aspects of the aviation products which were displayed at the Paris Air Show. The company is well established with offices in Europe, the United States, and has its headquarters in Israel. Should any Australian company or Government establishment require overseas representation, the author can well recommend this firm.

## 7. CONCLUDING REMARKS

The Australian Department of Defence presented aerospace products with commercial potential on the world market. In total, 16 Australian exhibitors presented their products and services. Australia's international reputation in the aerospace field was enhanced by the uniqueness of the inventions it presented. Interest was at a high level, with definite overseas sales potential applying for most of the Department of Defence products on display.

A great deal was learned from representation at the Paris Air Show. The author found it absolutely essential that a significant proportion of staff sent to technological exhibitions be practising engineers/scientists who have expert knowledge of and who firmly believe in the capability of the products they represent. These sentiments were borne out by the many professional management people who came to discuss specific engineering questions relating to individual products. Such discussions often provided the impetus for companies to apply for licence agreements, or for outright purchase of the product.

The benefit from active displays, supported by video film giving a visual real-life presentation of product capability, became evident in the very early days of the Air Show. However, it is considered essential that for any such product promotions in the future, a video tape of some two-to-three hours duration be available to show highlights of each product continuously without the need for frequent rewind/play attention by display staff.

The lack of personalized calling cards for the officers supervising the display caused problems that plagued those present for the duration of the show.

The unavailability of "saleable hardware" from the display stand was a significant drawback which the author recommends should be looked at seriously before any such product promotional exercises are considered in the future. For instance one visitor asked for six of the Instrumented Glove units to be wrapped up for immediate application. Being the chief test pilot for a large aircraft manufacturer, he indicated that a market for at least 150 gloves existed in the USA alone. Hence it was regrettable that no initial sales were possible.

It is the author's opinion that operational deficiencies, as outlined above, be corrected prior to future Department of Defence participation at important international technical exhibitions.

If Australia wishes to be accepted as a manufacturer of up-to-date aerospace products, and is to be able to compete with well known exporters of such products, then it is essential that it participate in such prestigious market arenas as the Paris and Farnborough Air Shows.

It is highly desirable that items selected for promotion at international air shows have production and marketing backup necessary to allow effective response to international customer enquiries which originate from such displays. It is not good enough to start looking for manufacturers after the product is wanted by customers who are unwilling to wait while Australia sorts out its manufacturing and marketing strategies.

#### ACKNOWLEDGEMENTS

The author wishes to acknowledge with immense gratitude the outstanding work of Mr. Kenneth F. Fraser, Principal Research Scientist, of the Aero-Propulsion Division of Aeronautical Research Laboratories. As co-inventor of FLUI, his leadership in all areas of research and development of FLUI, cannot be overstated. His advice in the preparation and editing of this report is most gratefully noted.

The support given to all Paris Air Show exhibitors by John Tinney Senior Trade Commissioner, Karl Lisners Trade Commissioner, and Trade staff from the Australian Embassy in Paris was excellent. The French hostesses Lilliane Ayats-Pontet, Marie-Christine Banet, Dianne Chevrelriere, Eva Gorokhoff, and Martha Ringheim-Assa, provided most effective support at the Australian stand, and at the chalet. They coped magnificently with the many enquiries from potential customers speaking any of eight languages. Their efficiency and the service they provided were very much appreciated by all exhibitors, who continue to give praise to Michel Petit, Denise Barbot, and the team members of the Department of Trade's "French Connection".

The assistance received by the author from the Commercial Councillor of the Australian Embassy in Tel Aviv, Mr. Bruce Lindenmayer, his most efficient secretary Leah, and the Marketing Officer Mr. George Wertheim, was very much appreciated. The appointments and outside visits which were arranged for the author, proved most useful in the assessment of the many companies which indicated an interest in Australian hi-tech products. Their efforts in promoting Australian products in Israel, and the encouragement they provide for many small companies wishing to find Australian partners for joint venture operations, would entitle Bruce and his team to be called by that well known Australian cliché "The Quiet Achievers".

REFERENCE

Handouts for Australian Department of Defence products displayed at the 1985 Paris Air Show, prepared by Defence Public Relations with the Defence Science and Technology Organisation.

1. Pilot's Force Measurement Glove
2. Doppler Navigation Trainer
3. Neo-natel Retrieval Unit (AEROMED)
4. Lifesaving Parachute
5. Winnin Rapid Launch All Weather Offboard Decoy
6. Fatigue Life Usage Indicator
7. Remote Control Parachute System
8. Box-launched IKARA - Australia's anti-submarine guided weapon
9. BARRA Sonobuoy - a step ahead in submarine detection
10. PHALANX - Australian ammunition
11. THUNDERFLASH - a realistic cost-effective military training aid

APPENDIX A

ADDRESSES OF ISRAELI COMPANIES VISITED

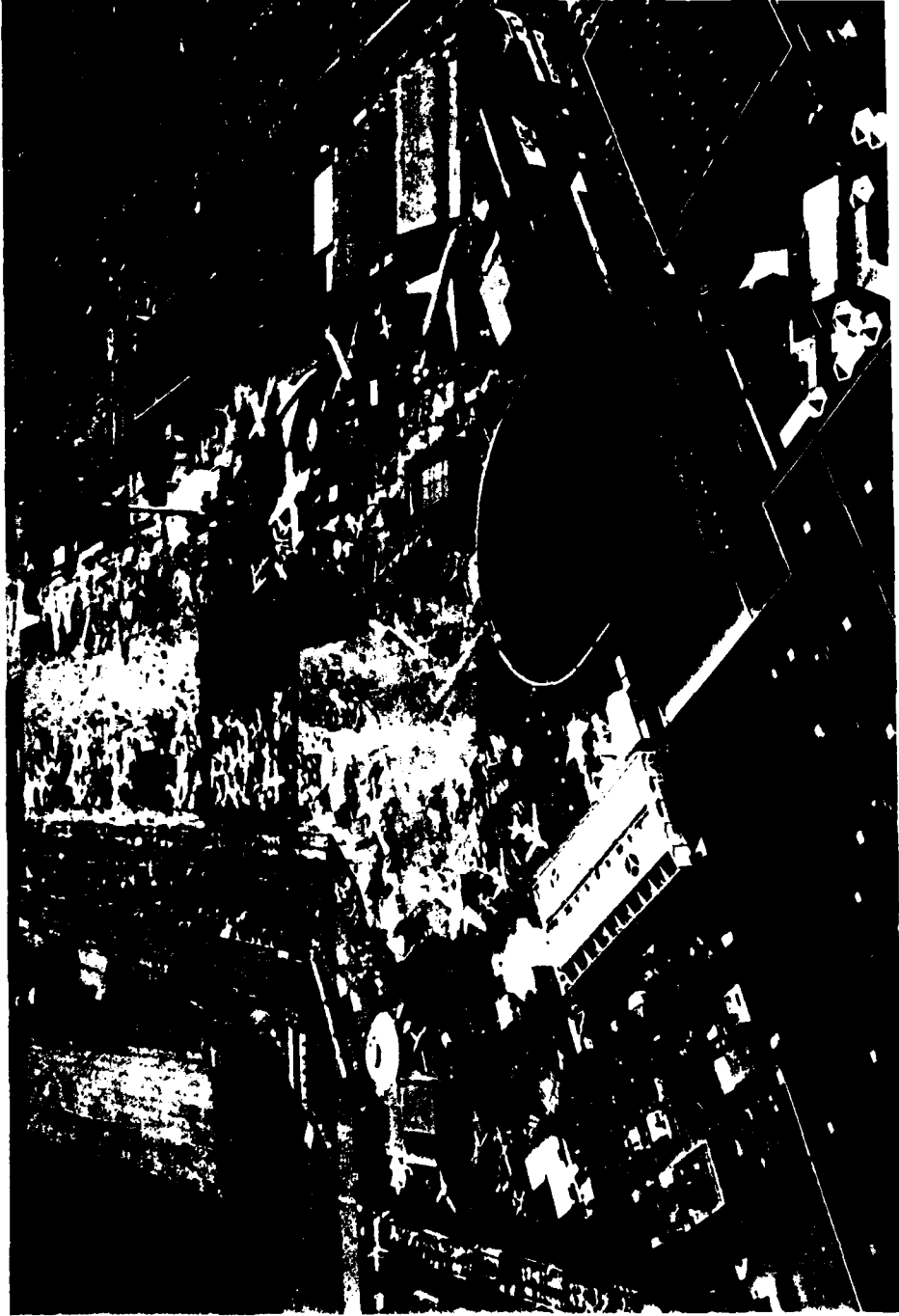
A list of postal addresses of the Israeli Aerospace companies visited by author during June and July 1985 follows.

MATA Helicopter Jerusalem  
P.O.B. 27/160 ATAROT  
Jerusalem Airport  
ISRAEL 91271

ELTA Electronics Industries Ltd.  
P.O.B. 330 Ashdod  
ISRAEL 77102

Mistral Technology Co.  
Suite 504B, Hadar Dafna Building  
39 Shaul Hamelech Blvd.  
Tel Aviv  
ISRAEL 64928





**FIGURE 2. OVERALL VIEW OF THE 36TH PARIS AIR SHOW**



**FIGURE 3. OVERALL VIEW OF THE COVERED DISPLAY AREA**



# 36th AIR SHOW

## 34 COUNTRIES REGISTERED TO DATE

ARGENTINA	FRANCE	POLAND
AUSTRIA	GREAT BRITAIN	PORTUGAL
AUSTRIA	GREECE	ROMANIA
BELGIUM	HUNGARY	SINGAPORE
BRAZIL	■ INDIA	SPAIN
CANADA	INDONESIA	SWEDEN
■ CHILI	ISRAEL	SWITZERLAND
■ CHINA	ITALY	UNITED STATES
CZECHOSLOVAKIA	JAPAN	USSR
■ DENMARK	MOROCCO	YUGOSLAVIA
FEDERAL GERMAN REPUBLIC	NORWAY	
FINLAND	NETHERLANDS	

■ For the first time at  
Le Bourget Air Show.

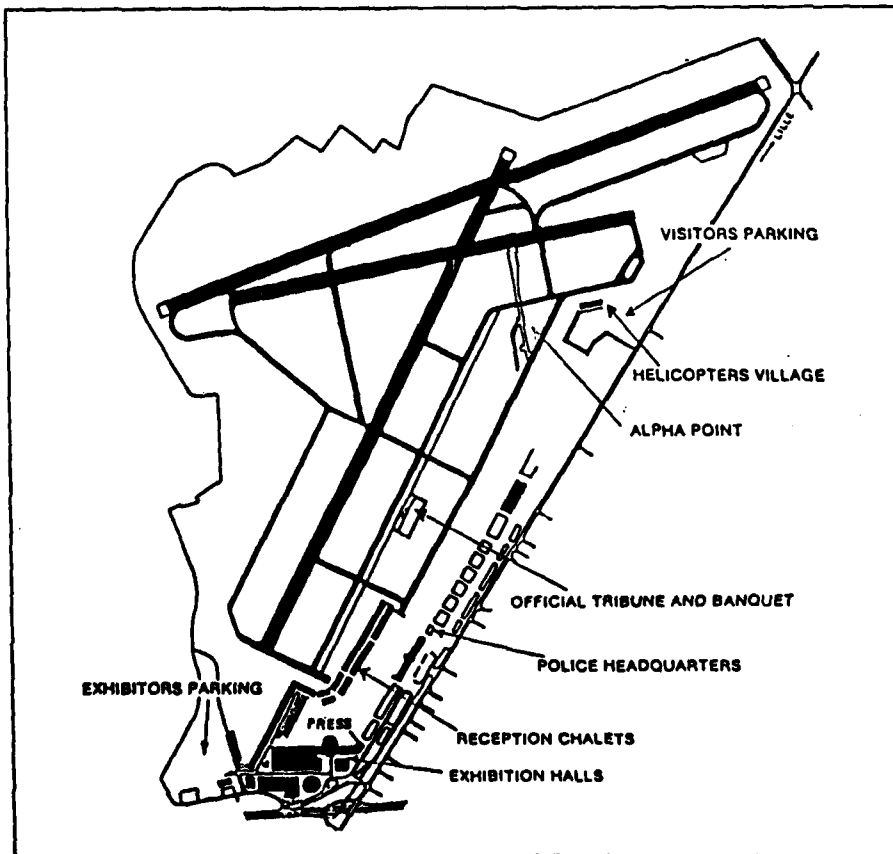


FIGURE 4. PARTICIPATING COUNTRIES AT THE 1985 AIR SHOW

COMPANY	LOCATION	AREA OF BUSINESS	LEVEL OF INTEREST						
			#1	2	3	4	5	6	7
Negretti Aviation	UK	Airborne Instruments & Data Acquisition	*			*	*	*	*
Westland	UK	Manufacture of Helicopters			*				
Satt Commu- nication	Sweden	Engine monitors				*	*	*	
Defence Dept of India	India	Directorate of Aeronautics	*	*	*		*		
Plessey Avionics	UK	Airborne Instrument & Data Systems	*			*	*	*	*
Dalmo Victor Bell Aerospace	USA	Manufacturer of Helicopters & Instruments	*			*	*	*	*
Thomas C. Wilson	USA	Tube Expanders & Tool Manufacturer	*	*			*	*	
Dowty Electronics	USA	Aircraft Data & Control Systems	*			*	*	*	*
Aero- spatiale	France	Manufacture of Helicopters & Instrumentation	*	*					*
Mata Helicopters	Israel	Manufacturer of Helicopters & Instrumentation	*	*		*	*	*	
Elta Electronics	Israel	Airborne Instrumentation Manufacturer				*			
Intercorp	Aust.	Aust & Overseas Equipment Distributor							*

# Explanatory note on code numbers:

- |                      |                                   |
|----------------------|-----------------------------------|
| 1: Purchase          | 4: Obtaining Agency               |
| 2: Price Information | 5: Joint Venture Arrangement      |
| 3: Literature        | 6: Licensing Agreement            |
|                      | 7: Interest in Overseas Promotion |

FIGURE 5. SUMMARY OF INTEREST IN FLUI FROM PARIS AIR SHOW

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16. Abstract  During June 1985 a number of aerospace products developed in Australia were displayed at the Paris Air Show. The Department of Defence was one of 16 exhibitors, and presented 14 products which it considered to have commercial potential on the world market.  As co-inventor of the Transmission Fatigue Life Usage Indicator (FLUI), which was one of the Department of Defence products exhibited, the author was seconded, as a technical representative to the official Defence product promotions team at the Air Show. Considerable interest was shown in the Department of Defence products presented in Paris, and subsequent visits to			

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<b>16. Abstract (Contd)</b>  aerospace companies in Israel, further demonstrated strong overseas interest in both manufacture and purchase of these products.		
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